Remarks

Claims 1, 3-10, 12-14, 16 and 18-20 are pending in the application. By this response, Applicants have amended several claims to further clarify the invention. No new matter has been added as a result of these amendments.

Claims 1, 3, 6-7, 10, and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wu U.S. Patent 6,423,963 B1, hereinafter "Wu."

Claims 1, 4-5, 8-10, and 13-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over Maddocks U.S. Patent 6,483,616 B1, hereinafter "Maddocks," in view of Rowley U.S. Patent 4,833,668, hereinafter "Rowley."

Claims 16 and 18-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Czarnocha U.S. Patent 6,504,630 B1, hereinafter "Czarnocha," in view of U.S. Rowley.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Czarnocha.

Each of the various rejections is overcome by various amendments and arguments that are presented.

Any amendments to any claim for reasons other than as expressly recited herein as being for the purpose of distinguishing such claim from known prior art are not being made with an intent to change in any way the literal scope of such claims or the range of equivalents for such claims. They are being made simply to present language that is better in conformance with the form requirements of Title 35 of the United States Code or is simply clearer and easier to understand than the originally presented language. Any amendments to any claim expressly made in order to distinguish such claim from known prior art are being made only with an intent to change the literal scope of such claim in the most minimal way, i.e., to just avoid the prior art in a way that leaves the claim novel and not obvious in view of the cited prior art, and no equivalent of any subject matter remaining in the claim is intended to be surrendered.

Also, since a dependent claim inherently includes the recitations of the claim or chain of claims from which it depends, it is submitted that the scope and content of any

dependent claims that have been herein rewritten in independent form is exactly the same as the scope and content of those claims prior to having been rewritten in independent form. That is, although by convention such rewritten claims are labeled herein as having been "amended," it is submitted that only the format, and not the content, of these claims has been changed. This is true whether a dependent claim has been rewritten to expressly include the limitations of those claims on which it formerly depended or whether an independent claim has been rewriting to include the limitations of claims that previously depended from it. Thus, by such rewriting no equivalent of any subject matter of the original dependent claim is intended to be surrendered. If the Examiner is of a different view, he is respectfully requested to so indicate.

Rejections Under 35 U.S.C. 103(a)

Claims 1, 3, 6-7, 10, and 12

Claims 1, 3, 6-7, 10, and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wu. The rejection is traversed because Wu fails to teach or suggest Applicants' invention as a whole.

Specifically, Wu does not teach or suggest at least the features of "reducing the power level of an optical signal propagating in an optical fiber path in response to a loss of a counter-propagating supervisory signal in the optical fiber path; reducing counter-propagating optical power in response to a loss of the optical signal", as recited in Applicants' claim 1.

Applicants' invention makes use of the respective loss of two counterpropagating signals (i.e., the optical data signal and the supervisory signal) to trigger separate actions of reducing the optical power propagating in the opposite direction.

Wu, on the other hand, teaches a method of shutting off optical power from a pump source in response to a change in a supervisor signal. There is simply no suggestion in Wu of detecting a loss of an optical data signal propagating in an opposite direction to the supervisor signal, and reducing the optical power in the counter-propagating direction in response to this loss.

Instead, the supervisor signal in Wu is the only signal used for detecting a fault. Thus, Wu teaches the alternative embodiment of providing both downstream and upstream hubs (e.g., 310 and 330 in Fig. 3) with separate supervisor signal sources and receivers (e.g., col. 7, line 48- col. 8, line 3) in order for downstream and upstream hubs to be aware of the fiber cut.

The need for additional supervisor signal transmitter and receiver is exactly one of those scenarios that Applicants' invention is designed to avoid (e.g., p.5, lines 10-23 of Applicants' specification). Applicants' invention provides for the use of both counterpropagating supervisory signal and optical data signal for fault detection - i.e., one network element detects the fault through a loss of the optical data signal, while the other network element detects the fault through a loss of the supervisory signal. This method of fault detection in both upstream and downstream network elements without the use of duplicate supervisor signal transmitter and receiver is certainly not obvious in view of Wu's teaching to the contrary.

Therefore, Applicants' claim 1 is patentable over Wu.

Independent claim 10 recites features similar to those of claim 1 that are not suggested or taught by Wu. For example, Wu does not teach or suggest features of detecting loss of or responsive to the loss of the optical data signal in steps c), d) and e). Therefore, independent claim 10 is also patentable over Wu.

Since all of the rejected dependent claims that depend from the current amended independent claims include all the limitations of the respective independent claim from which they ultimately depend, each such dependent claim is also allowable over Wu.

Therefore, claims 1, 3, 6-7, 10, 12, and 20 are allowable over Wu under 35 U.S.C. §103. Accordingly, the rejection should be withdrawn.

Claims 1, 4-5, 8-10, and 13-14

Claims 1, 4-5, 8-10, and 13-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over Maddocks in view of Rowley. The rejection is traversed.

Maddocks and Rowley singly or in combination fail to teach or suggest Applicants' invention as a whole.

As stated in the Office Action, Maddocks does not specifically teach that the supervisory signal is counter-propagating in the same fiber path. The Office Action thus cited Rowley's Fig. 2 as disclosing counter-propagating a supervisory signal in the same fiber path. For reasons set forth below, Maddocks and Rowley, even if combined, still would not render obvious Applicants' claimed invention.

For a bi-directional single fiber system, Maddocks specifically teaches, in column 3, lines 43-58, that the system would have to be modified to include in the supervisory channel an identifier signal for a particular transmitter. Based on the identifier signal, one can determine whether a received signal comes from a reflection back from a fiber cut. Rowley teaches a fiber with two counterpropagating data signals, one of which is inverted prior to transmission. This inverted signal serves a similar purpose as in Maddocks - that of identifying whether a received signal comes from a reflection back from a fiber cut.

That is, both Maddocks and Rowley rely on the use of a special signal - one in the supervisory channel, and the other, by inverting the data signal, in order to detect a fault based primarily on a reflected signal from the fiber cut. Neither Maddocks nor Rowley teaches or suggests a method that includes counterpropagating a supervisory signal with an optical data signal, and detecting loss of the optical data signal propagating in a fiber or taking subsequent actions in response to this loss of data signal, as in Applicants' claimed invention. Therefore, Applicants submit that independent claims 1 and 10 fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

Claims 4-5, 8-9, and 13-14 depend, either directly or indirectly, from independent claims 1 and 10 and recite additional features thereof. As such, and at least for the same reasons set forth above with respect to Applicants' independent claims 1 and 10, Applicants submit that these claims also fully satisfy the requirements of under 35 U.S.C. §103 and are patentable thereunder.

Therefore, claims 1, 4-5, 8-10, and 13-14 are allowable over Maddocks in view of Rowley under 35 U.S.C. §103. As such, Applicants respectfully request that the rejection be withdrawn.

Claims 16 and 18-19

Claims 16 and 18-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Czarnocha in view of Rowley. The rejection is traversed.

Czarnocha and Rowley, singly or in combination, fail to teach or suggest Applicants' invention as a whole.

The Office Action cited Czarnocha's Fig. 1, controller 126 and col. 6, lines 25-39 as teaching "the controller, in response to the absence of the counter-propagating supervisory signal, provides an indication to a downstream network element that the supervisory signal is absent" recited in Applicants' claim 16. Applicants respectfully disagree because this section of Czarnocha does not teach either counter-propagating supervisory signal or indicating to a downstream network element that the supervisory signal is absent.

Specifically, the cited section of Czarnocha discloses that "a message indicative of the detection of loss of signal power and supervisory signal power at optical amplifier 121 can be communicated to controller 126, which in turn can generate the appropriate messaging through the system for the user" (col. 6, lines 33-39). However, there is no teaching or suggestion regarding any counter-propagating supervisory signal.

Furthermore, as stated in col. 5, lines 34-66, Czarnocha uses a controller and supervisory unit of the downstream element 120 to shut off the amplifier 122 to emulate a fiber cut. This method uses the lack of a co-propagating traffic and supervisory signal to notify the upstream element 110. Czarnocha does not teach or suggest notifying a network element further downstream of the situation. Rowley also does not teach or suggest providing an indication to a downstream network element.

Thus, Czarnocha and Rowley, singly or in combination, do not teach or suggest a controller, in response to the absence of the counter-propagating supervisory signal, providing an indication to a downstream network element that the supervisory signal is absent.

The Office Action, acknowledging that Czarnocha does not specifically teach that the supervisory signal is counter-propagating in the upstream optical fiber path, further cited Rowley as disclosing counter-propagating a supervisory signal, e.g., Fig. 2.

However, as previously discussed, Rowley teaches two counterpropagating data signals, one being transmitted in inverted form to serve as an identifier of the particular transmitter. Even if one assumes, as in the Office Action, that a supervisory signal is also carried in the same fiber as the data signals, Rowley's supervisory fault and error detector carries out only normal fault checks such as frame alignment signal, supervisory checks and checks for faults in line code (col. 5, lines 30-33). In the case of a fiber-cut fault that leads to a loss in the transmitted supervisory or data signals, Rowley's method relies on the detection or absence of a reflected signal from the fiber cut to determine whether a fault exists, for example, based on an incorrectly inverted data received at a particular station (col. 5, lines 37-64).

In sum, Rowley does not teach or suggest a method or network components adapted for responding to a loss or absence of the counter-propagating supervisory signal in the optical fiber path in the manner recited in Applicants' claim 16.

As such, Applicants submit that independent claim 16 fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder.

Furthermore, claims 18-19 depend, either directly or indirectly, from independent claim 16 and recite additional features thereof. As such, and at least for the same reasons set forth above with respect to Applicants' independent claim 16, Applicants submit that these claims are also non-obvious and allowable under 35 U.S.C. §103.

Therefore, claims 16, and 18-19 are allowable over Czarnocha in view of Rowley under 35 U.S.C. §103. As such, Applicants respectfully request that the rejection be withdrawn.

Claim 20

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Czarnocha. The rejection is traversed.

Claim 20 has been amended to further clarify the invention. Wu and Czarnocha, singly or in combination, fail to teach or suggest Applicants' invention as a whole.

As stated in the Office Action, Wu does not teach specifically disclose "a controller, in response to the absence of the counter-propagating supervisory signal, provides an indication to a third network element that the supervisory signal is absent".

The Office Action relies on Czarnocha's col. 6, lines 33-39, as disclosing the above features missing from Wu. Applicants respectfully disagree.

Specifically, the supervisory signal and data signal in Czaronacha's Fig. 1 are not counter-propagating, but co-propagating. The cited section of Czaronacha teaches generally that a message indicative of the detection of loss of signal power and supervisory signal power be "communicated to controller 126, which in turn can generate the appropriate messaging through the system for the user". However, Fig. 1 shows two network elements 110 and 120, and the corresponding discussion (e.g., col. 5, line 34-col. 6, line 23) teaches communication to the upstream network element 110 for shutting down of output power. There is no specific teaching of providing an indication to a third network element regarding the absence of the supervisory signal.

As such, neither Wu nor Czaronacha, either singly or in combination, teaches or suggests Applicants' claim 20. Therefore, claim 20 is patentable under Wu in view of Czaronacha.

Conclusion

It is respectfully submitted that the Office Action's rejections have been overcome and that this application is now in condition for allowance. Reconsideration and allowance are, therefore, respectfully solicited.

If, however, the Examiner still believes that there are unresolved issues, the Examiner is invited to call Eamon Wall at (732) 530-9404 so that arrangements may be made to discuss and resolve any such issues.

Respectfully,

Date: 11/16/06

By _____
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